

IN THE CLAIMS:

1. (previously amended) A plating apparatus for the spine, comprising:
a plate having a generally triangular shape and having an upper node and a pair of lower nodes;
an upper hole in the plate at the upper node to receive a screw for passage into an L5 vertebra; and
a first lower hole in the plate formed through one of the lower nodes to receive a screw for passage into the S1 vertebra and a second lower hole in the plate through the other of the lower nodes to receive a screw for passage into the S1 vertebra, wherein said plate includes a profile along said upper node and said pair of lower nodes adapted to conform to the anterior margin of at least one of the L5 and S1 vertebrae.
2. (original) The apparatus of claim 1, wherein said plate has lateral edges extending between said upper node and each of said lower nodes, said lateral edges having a concave profile.
3. (original) The apparatus of claim 1, wherein said plate includes at least one spike extending from a posterior face of said plate positionable into the L5 vertebra.
4. (original) The apparatus of claim 1, wherein said plate has a posterior face positionable against the L5 vertebra and the S1 vertebra, said posterior face having a concave profile.
5. (original) The apparatus of claim 4, wherein said plate includes a protrusion extending from said posterior face adapted to contact the inferior margin of the L5 vertebra.
6. (original) The apparatus of claim 5, wherein said lower nodes each have a thickened portion adapted to conform to the profile of anterior face of the S1 vertebra.
7. (original) The apparatus of claim 1, wherein said upper hole has a screw axis oriented at an angle with respect to an axis extending perpendicular to an anterior face of said plate.

8. (original) The apparatus of claim 1, wherein said plate has a central hole located between said upper node and said pair of lower nodes.

9. (original) The apparatus of claim 8, wherein said plate includes a retaining element attachable to said central hole.

10. (original) The apparatus of claim 9, wherein said retaining element has a generally triangular shape.

11. (original) The apparatus of claim 9, wherein said retaining element has a circular shape.

12. (previously amended) The apparatus of claim 9, wherein said retaining element has three cutouts positionable adjacent respective ones of said holes to allow screw passage into said holes, said cutouts defining flanges therebetween, wherein said retaining element is movable with respect to said plate so that said flanges block screws inserted into said holes.

13. (original) The apparatus of claim 1, wherein said plate includes a retaining element adjacent each of said upper hole and said first and second lower holes, each of said retaining elements having a first form wherein a screw is insertable into the adjacent hole and being formable to a second form wherein said retaining element extends over the adjacent hole.

14. (original) A plating apparatus for the spine, comprising:
a plate having an upper face, a lower face, and at least one hole therethrough extending between said upper and lower faces; and
a retaining element extending from said upper face adjacent said at least one hole, said retaining element having a first form wherein a screw is insertable into the at least one hole and being formable to a second form wherein at least a portion of said retaining element extends over said at least one hole.

15. (original) The apparatus of claim 14, wherein said retaining element is formed by applying a bending force to said retaining element.

16. (original) The apparatus of claim 14, wherein:

said plate has a generally triangular shape and includes an upper node and a pair of lower nodes; and

said at least one hole includes an upper hole through said plate at said upper node to receive a screw for passage into an upper vertebra, a first lower hole in said plate formed through one of said lower nodes to receive a screw for passage into a lower vertebra, and a second lower hole in said plate through the other of said lower nodes to receive a screw for passage into the lower vertebra.

17. (original) The apparatus of claim 16, wherein said retaining element is positioned adjacent said upper hole and further comprising:

a first lower retaining element extending from said upper face adjacent said first lower hole; and

a second lower retaining element extending from said upper face adjacent said second lower hole, wherein said first and second lower retaining elements each have a first form wherein a screw is insertable into the adjacent hole and are formable to a second form wherein at least a portion of said retaining element extends over said adjacent hole.

18. (original) The apparatus of claim 17, wherein each of said retaining elements includes a connecting member integrally formed with said upper face of said plate.

19. (original) The apparatus of claim 18, wherein each of said retaining elements extends around said adjacent hole.

20. (original) The apparatus of claim 16, wherein each of said retaining elements extends from a base member attached to said upper face of said plate.

21. (original) The apparatus of claim 20, wherein there is a gap between said base member and each of said retaining elements.

22. (previously amended) A plating apparatus for the spine, comprising:
a plate having a generally triangular shape with an upper node positionable along an upper vertebra and a pair of lower nodes positionable along a lower vertebra;
an upper hole in the plate at the upper node to receive a screw for engaging the upper vertebra;
a first lower hole in the plate through one of the lower nodes to receive a screw for engaging the lower vertebra and a second lower hole in the plate through the other of the lower nodes to receive a screw for engaging the lower vertebra, wherein said upper hole extends through said plate along an axis oriented away from said pair of lower nodes; and
means for blocking screws inserted in the upper hole and the first and second lower holes.

23. (original) The apparatus of claim 22, wherein said means for blocking includes a triangular retaining element attached to said plate, said retaining element being movable from a first orientation wherein screws are insertable into each of said upper hole and said first and second lower holes to a second orientation wherein apices of said retaining element extend over respective ones of said upper hole and said first and second lower holes.

24. (original) The apparatus of claim 23, wherein said retaining element includes a spring blade extendable therefrom to secure said retaining element in said second orientation.

25. (original) The apparatus of claim 23, wherein said retaining element includes a locking fastener extending therethrough and engageable to a central hole in said plate to secure said retaining element in said second orientation.

26. (original) The apparatus of claim 22, wherein said means for blocking includes a retaining element adjacent respective ones of said upper hole and said first and second lower holes.

27. (original) The apparatus of claim 26, wherein each of said retaining elements has a first form wherein a screw is insertable in said adjacent hole and is deformable to a second form wherein said retaining element extends over said adjacent hole.

28. (original) A method of stabilizing the L5 and S1 vertebrae, comprising:
installing a generally triangular-shaped plate having an upper node along the anterior face of the L5 vertebra and a pair of lower nodes along the anterior face of the S1 vertebra;

installing a first screw through a single hole in the upper node of the plate into L5;
and

installing second and third screws through a hole in each of the lower nodes of the plate and into S1.

29. (original) The method of claim 28 and further comprising installing a retaining element on the plate to block the first, second and third screws in their respective holes.

30. (original) The method of claim 28 and further comprising rotating a retaining element pre-fitted on the plate to block the first, second and third screws in their respective holes.

31. (original) The method of claim 28 and further comprising inserting a fusion device in the disc space between the L5 and S1 vertebrae before installing the plate.

32. (original) The method of claim 31 and further comprising coupling the plate to an instrument having a guiding portion for guiding a drill and screw placement into each of said holes before installing the plate.

33. (previously amended) A plating apparatus for the spine, comprising:

a plate having a general triangular shape, said plate having an upper hole near an upper vertex through which a screw is passed for securing said plate to the L5 vertebra, and a pair of lower holes situated near respective ones of first and second lower vertices of said plate, each of said pair of lower holes having a screw passed therethrough to secure said plate to the S1 vertebra, wherein said plate includes a profile between said upper vertex and said first and second lower vertices adapted to conform to the anterior margin of at least one of the L5 and S1 vertebrae.

34. (original) The apparatus of claim 33, wherein said plate includes a posterior face having a protrusion extending along at least part of the width of said plate that bears against a lower lip of an anterior margin of a lower endplate of the L5 vertebra.

35. (original) The apparatus of claim 34, wherein said plate includes on said posterior face adjacent said pair of lower vertices protrusions that bear against a lower margin of an upper endplate of the S1 vertebra.

36. (original) The apparatus of claim 33, wherein said plate includes a posterior face having an edge about said plate, said posterior face including a ridge shaped protrusion adjacent said edge at the upper end of said upper vertex.

37. (original) The apparatus of claim 33, wherein said plate includes a posterior face having an edge about said plate, said posterior face including an anchoring point extending therefrom adjacent said upper vertex.

38. (original) The apparatus of claim 33, wherein said plate includes a posterior face having a generally concave shape.

39. (original) The apparatus of claim 33, wherein said pair of lower holes have an oblong shape extending in the direction toward said upper vertex.

40. (original) The apparatus of claim 33, further comprising means for blocking screws seated in said upper hole and said pair of lower holes.

41. (original) The apparatus of claim 40, wherein said means for blocking screws includes a retaining element attachable to a central hole in said plate, said retaining element configured to at least partially cover said upper hole and said pair of lower holes.

42. (original) The apparatus of claim 41, wherein said retaining element has a substantially circular shape.

43. (original) The apparatus of claim 41, wherein said retaining element includes means for fixing said retaining element on said plate either in a first angular position leaving said upper hole and said pair of lower holes completely uncovered, or in a second angular position at least partially covering said upper hole and said pair of lower holes.

44. (original) The apparatus of claim 43, wherein said means for fixing said retaining element includes an elastic tongue including a stud extending from a posterior face of said retaining element, said stud insertable in receiving seats formed on an anterior face of said plate.

45. (original) The apparatus of claim 40, wherein said means for blocking screws includes a retaining element threadingly attached to a central hole in said plate, said retaining element being configured to at least partially cover said upper hole and said pair of lower holes.

46. (original) The apparatus of claim 40, wherein said means for blocking screws includes a retaining element which can be screwed onto said plate.

47. (original) The apparatus of claim 46, wherein said retaining element has a generally triangular shape.

48. (original) The apparatus of claim 40, wherein said means for blocking screws includes a retaining element having three projecting flanges and cutouts between said flanges, whereby each of said flanges is positionable between respective adjacent ones of said upper hole and said pair of lower holes for screw insertion, said retaining element being movable to a second position wherein each of said flanges at least partially covers respective ones of said upper hole and said pair of lower holes.

49. (original) A system for fusion of the L5 and S1 junction of the spine, comprising:

- a plate having a triangular shape, said plate having an upper vertex positionable over L5 and lower vertices positionable over S1, each of said vertices having a hole formed therethrough;

- three screws, each of said screws positioned through a corresponding one of said holes to secure said plate to L5 and S1; and

- an interbody fusion device positioned in the disc space between L5 and S1.

50. (original) The system of claim 49, wherein said interbody fusion device includes a bone graft.

51. (previously amended) A system for securing a plate to a spinal column segment, the system comprising:

- a plate having a generally triangular shape forming three vertices, said plate having a hole adjacent each vertex;

an instrument including:

a plate holding portion coupled to said plate and being configured to establish and maintain a defined relative position between said instrument and said plate;

a shaft having a proximal handle portion and a distal end supporting said plate holding portion; and

a support extending from said shaft, said support defining three guiding portions, each of said guiding portions corresponding to a respective one of said holes of said plate and arranged to guide a drill to said corresponding hole.

52. (original) The system of claim 51, further comprising a rod coupled to said shaft, said rod terminating in a bearing surface that bears on S1 upon positioning of said plate on the spinal column segment.

53. (original) The system of claim 51, further comprising a pusher that includes means for maintaining a position of said pusher on said plate.

54. (original) The system of claim 51, wherein said plate holding portion is detachable from said shaft.

55. (original) The system of claim 51, wherein the position of said support is adjustable.

56. (original) The system of claim 51, wherein said plate holding portion is attached to a lower edge of the plate.

57. (original) The system of claim 51, wherein said plate holding portion is attached to a hole in the center of said plate.

58. (previously added) A plating apparatus for the spine, comprising:

a plate having an upper face, a lower face, and at least one hole therethrough extending between said upper and lower faces; and

a retaining element extending from said upper face adjacent said at least one hole, said retaining element having a first form wherein a screw is insertable into the at least one hole and being formable to a second form wherein at least a portion of said retaining element extends over said at least one hole, wherein said retaining element is formed by applying a bending force to said retaining element.

59. (previously added) The apparatus of claim 58, wherein:

said plate has a generally triangular shape and includes an upper node and a pair of lower nodes; and

said at least one hole includes an upper hole through said plate at said upper node to receive a screw for passage into an upper vertebra, a first lower hole in said plate formed through one of said lower nodes to receive a screw for passage into a lower vertebra, and a second lower hole in said plate through the other of said lower nodes to receive a screw for passage into the lower vertebra.

60. (previously added) The apparatus of claim 59, wherein said retaining element is positioned adjacent said upper hole and further comprising:

a first lower retaining element extending from said upper face adjacent said first lower hole; and

a second lower retaining element extending from said upper face adjacent said second lower hole, wherein said first and second lower retaining elements each have a first form wherein a screw is insertable into the adjacent hole and are formable to a second form wherein at least a portion of said retaining element extends over said adjacent hole.

61. (previously added) The apparatus of claim 60, wherein each of said retaining elements includes a connecting member integrally formed with said upper face of said plate.

62. (previously added) The apparatus of claim 61, wherein each of said retaining elements extends around said adjacent hole.

63. (previously added) The apparatus of claim 59, wherein each of said retaining elements extends from a base member attached to said upper face of said plate.

64. (previously added) The apparatus of claim 63, wherein there is a gap between said base member and each of said retaining elements.

65. (previously added) A plating apparatus for the spine, comprising:
a plate having a generally triangular shape with an upper node positionable along an upper vertebra and a pair of lower nodes positionable along a lower vertebra;
an upper hole in the plate at the upper node to receive a screw for engaging the upper vertebra;
a first lower hole in the plate through one of the lower nodes to receive a screw for engaging the lower vertebra and a second lower hole in the plate through the other of the lower nodes to receive a screw for engaging the lower vertebra; and
means for blocking screws inserted in the upper hole and the first and second lower holes, wherein said means for blocking includes a triangular retaining element attached to said plate, said retaining element being movable from a first orientation wherein screws are insertable into each of said upper hole and said first and second lower holes to a second orientation wherein apices of said retaining element extend over respective ones of said upper hole and said first and second lower holes, wherein said retaining element includes a spring blade extendable therefrom to secure said retaining element in said second orientation.

66. (previously added) The apparatus of claim 65, wherein said retaining element includes a locking fastener extending therethrough and engageable to a central hole in said plate to secure said retaining element in said second orientation.

67. (previously added) A plating apparatus for the spine, comprising:

a plate having a general triangular shape, said plate having an upper hole near an upper vertex through which a screw is passed for securing said plate to the L5 vertebra, and a pair of lower holes situated near respective ones of first and second lower vertices of said plate, each of said pair of lower holes having a screw passed therethrough to secure said plate to the S1 vertebra; and

means for blocking screws seated in said upper hole and said pair of lower holes, wherein said means for blocking screws includes a retaining element threadingly attached to a central hole in said plate, said retaining element being configured to at least partially cover said upper hole and said pair of lower holes.

68. (previously added) The apparatus of claim 67, wherein said plate includes a posterior face having a protrusion extending along at least part of the width of said plate that bears against a lower lip of an anterior margin of a lower endplate of the L5 vertebra.

69. (previously added) The apparatus of claim 68, wherein said plate includes on said posterior face adjacent said pair of lower vertices protrusions that bear against a lower margin of an upper endplate of the S1 vertebra.

70. (previously added) The apparatus of claim 67, wherein said plate includes a posterior face having an edge about said plate, said posterior face including a ridge shaped protrusion adjacent said edge at the upper end of said upper vertex.

71. (previously added) The apparatus of claim 67, wherein said plate includes a posterior face having an edge about said plate, said posterior face including an anchoring point extending therefrom adjacent said upper vertex.

72. (previously added) The apparatus of claim 67, wherein said plate includes a posterior face having a generally concave shape.

73. (previously added) The apparatus of claim 67, wherein said pair of lower holes have an oblong shape extending in the direction toward said upper vertex.

74. (previously added) The apparatus of claim 67, wherein said retaining element has a substantially circular shape.

75. (previously added) The apparatus of claim 67, wherein said retaining element includes means for fixing said retaining element on said plate either in a first angular position leaving said upper hole and said pair of lower holes completely uncovered, or in a second angular position at least partially covering said upper hole and said pair of lower holes.

76. (previously added) The apparatus of claim 75, wherein said means for fixing said retaining element includes an elastic tongue including a stud extending from a posterior face of said retaining element, said stud insertable in receiving seats formed on an anterior face of said plate.

77. (previously added) The apparatus of claim 67, wherein said retaining element has a generally triangular shape.

78. (previously added) The apparatus of claim 67, wherein said retaining element include three projecting flanges and cutouts between said flanges, whereby each of said flanges is positionable between respective adjacent ones of said upper hole and said pair of lower holes for screw insertion, said retaining element being movable to a second position wherein each of said flanges at least partially covers respective ones of said upper hole and said pair of lower holes.

79. (previously added) A plating apparatus for the spine, comprising:
a plate having a general triangular shape, said plate having an upper hole near an upper vertex through which a screw is passed for securing said plate to the L5 vertebra,

and a pair of lower holes situated near respective ones of first and second lower vertices of said plate, each of said pair of lower holes having a screw passed therethrough to secure said plate to the S1 vertebra;

a retaining element attachable to a central hole in said plate, said retaining element configured to at least partially cover said upper hole and said pair of lower holes, said retaining element including an elastic tongue with a stud extending from a posterior face of said retaining element, said stud insertable in a receiving seat formed on an anterior face of said plate.

80. (previously added) The apparatus of claim 79, wherein said plate includes a posterior face having a protrusion extending along at least part of the width of said plate that bears against a lower lip of an anterior margin of a lower endplate of the L5 vertebra.

81. (previously added) The apparatus of claim 80, wherein said plate includes on said posterior face adjacent said pair of lower vertices protrusions that bear against a lower margin of an upper endplate of the S1 vertebra.

82. (previously added) The apparatus of claim 79, wherein said plate includes a posterior face having an edge about said plate, said posterior face including a ridge shaped protrusion adjacent said edge at the upper end of said upper vertex.

83. (previously added) The apparatus of claim 79, wherein said plate includes a posterior face having an edge about said plate, said posterior face including an anchoring point extending therefrom adjacent said upper vertex.

84. (previously added) The apparatus of claim 79, wherein said plate includes a posterior face having a generally concave shape.

85. (previously added) The apparatus of claim 79, wherein said pair of lower holes have an oblong shape extending in the direction toward said upper vertex.

86. (previously added) The apparatus of claim 79, wherein said retaining element has a substantially circular shape.

87. (previously added) The apparatus of claim 79, wherein said retaining element has a generally triangular shape.

88. (previously added) The apparatus of claim 79, wherein said retaining element includes three projecting flanges and cutouts between said flanges, whereby each of said flanges is positionable between respective adjacent ones of said upper hole and said pair of lower holes for screw insertion, said retaining element being movable to a second position wherein each of said flanges at least partially covers respective ones of said upper hole and said pair of lower holes.